

Appl. No. 09/911,066 (parent application)
Amdt. Dated August 5, 2003

Amendments to the Claims are reflected in the listing of the claims which begins on page 3 of this paper.

Remarks/Arguments begin on page 17 of this paper.

Amendments to the Claims:

This listing will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1-89 (presently canceled)

Claim 90 (new): A channel selector valve for selecting a channel of fluid by employing non-electric motive power generated when a control section controls a physical quantity of the fluid, wherein a drive source provided separately from the channel selector valve generates the non-electric motive power, by which the channel is passively selected, and the drive source comprises at least one of element components in a refrigerating cycle having the channel selector valve and said at least one of element components generates the non-electric motive power.

Claim 91 (new): The channel selector valve according to claim 90, wherein said motive power is generated due to a change in physical quantity, which arises in the refrigerating cycle from an action of said at least one of the element components.

Claim 92 (new): The channel selector valve according to claim 91, wherein said change in

physical quantity is at least one change among changes in pressure, differential pressure and flow rate of fluid in the channel selector valve, said changes arising from an action of said at least one of the element components.

Claim 93 (new): A device for controlling a refrigerating cycle, which controls a channel selector valve communicated to the refrigerating cycle, characterized in that:

the device controls at least one of a plurality of functional components communicated to the refrigerating cycle so as to control the refrigerating cycle; and

the device controls the channel selector valve by controlling the functional components.

Claim 94 (new): A device for controlling a refrigerating cycle, which controls a channel selector valve communicated to the refrigerating cycle, characterized in that:

the device controls at least one of a plurality of functional components communicated to the refrigerating cycle so as to control the refrigerating cycle; and

the device generates a non-electrical motive power by controlling the functional components and passively controls the channel selector valve by employing the motive power.

Claim 95 (new): A device for controlling a refrigerating cycle, which controls a channel selector valve communicated to the refrigerating cycle comprising:

a microcomputer that controls at least one of a plurality of functional components communicated to the refrigerating cycle so as to control the refrigerating cycle; and

a control program, by which the microcomputer performs a processing that controls the functional components so as to generate a non-electrical motive power for passively controlling the channel selector valve.

Claim 96 (new): A device for controlling a refrigerating cycle, which controls a channel selector valve communicated to the refrigerating cycle, characterized in that:

the device controls at least, one of a plurality of functional components communicated to the refrigerating cycle so as to control the refrigerating cycle;

the non-electrical motive power generated by controlling the functional components is a physical quantity or a rate of change in a physical quantity generated by the refrigerating cycle; and

the device passively controls the channel selector valve by the physical quantity or the rate of change in a physical quantity.

Claim 97 (new): A device for controlling a refrigerating cycle, which controls a channel selector valve communicated to the refrigerating cycle, comprising:

a microcomputer that controls at least one of a plurality of functional components communicated to the refrigerating cycle so as to control the refrigerating cycle; and

a control program, by which the microcomputer performs a processing that controls the functional components so as to allow the refrigerating cycle to generate a physical quantity or a rate of change in a physical quantity as a non-electrical motive power for passively controlling

the channel selector valve.

Claim 98 (new): The device for controlling a refrigerating cycle as claimed in claim 94, wherein the physical quantity, which is a base for controlling the functional components to generate the non-electrical motive power, is a parameter selected from the group consisting of a pressure, temperature, rate of flow, voltage, current, electrical frequency and mechanical oscillation frequency with respect to a control of the refrigerating cycle.

Claim 99 (new): The device for controlling a refrigerating cycle as claimed in claim 94, wherein the physical quantity, which is the non-electrical motive power and is generated by the refrigerating cycle, is a pressure, differential pressure or rate of flow with respect to fluid existing in the channel selector valve, and

the rate of change in a physical quantity, which is the non-electrical motive power and is generated by the refrigerating cycle, is a rate of change in pressure, rate of change in differential pressure or rate of change in rate of flow with respect to the fluid.

Claim 100 (new): device for controlling a refrigerating cycle, which controls a channel selector valve communicated to the refrigerating cycle, comprising a control section that receives input signals sent from an operation command section for commanding an operational condition of the refrigerating cycle and a physical quantity detector section for detecting a physical quantity generated by the refrigerating cycle, wherein the control section sends output signals to a driving

section that drives a drive source of at least one of a plurality of functional components communicated to the refrigerating cycle so as to control said functional component, and the device generates a non-electrical motive power by controlling the refrigerating cycle and passively controls the channel selector valve by the motive power.

Claim 101 (new): The device for controlling a refrigerating cycle according to claim 100, wherein the control section controls at least one of a plurality of functional components communicated to the refrigerating cycle so as to start an operation of the refrigerating cycle, thereby controlling the channel selector valve in a state corresponding to the start of an operation, which is commanded by the operation command section.

Claim 102 (new): The device for controlling a refrigerating cycle according to claim 101, wherein the control section starts to operate a compressor communicated to the refrigerating cycle in a direction of inverse rotation when the control section decides to select the channel selector valve on the basis of a command of the operation command section.

Claim 103 (new): The device for controlling a refrigerating cycle according to claim 100, wherein the control section controls at least one of a plurality of functional components communicated to the refrigerating cycle so as to operate the refrigerating cycle, thereby controlling the channel selector valve in a state corresponding to the operation, which is commanded by the operation command section.

Claim 104 (new): The device for controlling a refrigerating cycle according to claim 100, wherein the control section controls at least one of a plurality of functional components communicated to the refrigerating cycle so as to halt an operation of the refrigerating cycle, thereby controlling the channel selector valve in a state corresponding to the halt of the operation, which is commanded by the operation command section.

Claim 105 (new): The device for controlling a refrigerating cycle as claimed in claim 100, wherein the channel selector valve is constructed in a manner that a movable member moves so as to select a channel, and the control section comprises at least one unit selected from the group consisting of: a memory unit for memorizing position data of the movable member of the channel selector valve; a comparison unit and a judge unit for comparing and judging, respectively, the position data and operation command data; and a learning unit learning on the basis of physical quantity data by a control of functional components and control data of the channel selector valve.

Claim 106 (new): The device for controlling a refrigerating cycle according to claim 105, wherein the control section receives the input signals, performs a predetermined processing and judges whether a channel is to be changed or not to be changed by the channel selector valve, then confirms a position on the basis of present position data, then sends the output signals to the driving section so as to control the functional

components in the refrigerating cycle,

then receives new input signals after a predetermined period of time, confirms a position of the movable member, and sets position data of said position as new present position data when said position is changed to a new position.

Claim 107 (new): The device for controlling a refrigerating cycle according to claim 106, wherein the control section confirms a position of the movable member by at least one temperature detection means for detecting temperature, at least one pressure detection means for detecting pressure, at least one magnetism detection means for detecting magnetism, at least one current detection means for detecting current or a combination thereof after a predetermined period of time, and then installs position data corresponding to said position into the memory unit of the control section.

Claim 108 (new): A device for controlling a refrigerating cycle, which controls a channel selector valve that is communicated to a refrigerating cycle and selects a channel by a movement of a movable member, comprising:

a microcomputer that controls at least one of a plurality of functional components communicated to the refrigerating cycle so as to control the refrigerating cycle; and

a control program, by which the microcomputer performs a processing consisting of the steps of:

receiving input signals;

confirming a position by taking out present position data of a movable member installed in a memory unit;

carrying out an operation to decide whether the movable member is to be moved or not to be moved, comparing, and judging;

selecting and deciding a driving section;

outputting drive signals to the driving section selected and decided;

judging a position of the movable member by input signals after a predetermined period of time, with or without moving a position of the movable member by a physical quantity generated by at least one functional component that is selected and decided in said step of selecting and deciding or a rate of the physical quantity; and

installing position data of a position of the movable member into the memory unit when said position is changed to a new position, in order to control the driving section for driving the functional component so that the position of the movable member is to be moved or not to be moved.

Claim 109 (new): A device for controlling a refrigerating cycle, which controls a channel selector valve communicated to the refrigerating cycle, comprising:

a control section that receives input signals sent from an operation command section for commanding an operation state of the refrigerating cycle and from a physical quantity detector section for detecting a physical quantity generated by the refrigerating cycle, wherein the control section sends output signals to a driving section that drives a drive source of at least one of a

plurality of functional components communicated to the refrigerating cycle so as to control said functional component and to control the refrigerating cycle, and when judging to select a channel by using the channel selector valve on the basis of a command of the operation command section, the control section sends output signals to a driving section for driving a power source of a compressor so as to start an operation of the compressor of the refrigerating cycle and starts an operation of the refrigerant cycle so as to generate a motive power exceeding a first predetermined motive power, thereby the channel selector valve is passively controlled.

Claim 110 (new): A device for controlling a refrigerating cycle, which controls a channel selector valve communicated to the refrigerating cycle, comprising:

a control section that receives input signals sent from an operation command section for commanding an operation state of the refrigerating cycle and from a physical quantity detector section for detecting a physical quantity generated by the refrigerating cycle, wherein the control section sends output signals to a driving section that drives a drive source of at least one of a plurality of functional components communicated to the refrigerating cycle so as to control said functional component and to control the refrigerating cycle, and when judging to select a channel by using the channel selector valve on the basis of a command of the operation command section, the control section sends output signals to a driving section for driving a power source of a compressor so as to start an operation of the compressor in a direction of inverse rotation and starts an operation of the refrigerant cycle so as to generate a motive power exceeding a third predetermined motive power, thereby the channel selector valve is passively controlled.

Claim 111 (new): The device for controlling a refrigerating cycle according to claim 109,
wherein the first and second positions in response to an internal motive power,

the control section memorizes position data corresponding to the first or second position
of the movable member in a memory unity thereof,

the control section starts an operation of the refrigerating cycle when the position data
indicates the second or first position,

halts the operation of the refrigerating cycle with renewing position data in the memory
unit to the first or second position, respectively, after a first predetermined period of time, and

keeps the operation of the refrigerating cycle standby during a third predetermined period
of time.

Claim 112 (new): The device for controlling a refrigerating cycle according to claim 109,
wherein the control section operates the compressor in a specific frequency immediately after
starting the operation of the compressor and starts an operation of the refrigerating cycle so that a
motive power exceeding a first predetermined motive power is generated as an internal motive
power of the channel selector valve.

Claim 113 (new): The device for controlling a refrigerating cycle according to claim 109,
wherein the control section starts an operation of the compressor with a first predetermined
capacity.

Claim 114 (new): The device for controlling a refrigerating cycle according to claim 109, wherein the control section starts an operation of the compressor with a second predetermined capacity so that a motive power lower than a first predetermined motive power is generated as an internal motive power of the channel selector valve,

then operates the refrigerating cycle for a fourth predetermined period of time,

then halts the operation of the refrigerating cycle for a fifth predetermined period of time,

and

then starts an operation of the compressor with a first predetermined capacity so that a motive power exceeding a first predetermined motive power is generated as an internal motive power of the channel selector valve.

Claim 115 (new): The device for controlling a refrigerating cycle according to claim 109, wherein the control section sends output signals to a throttle device driving section so that an opening ratio of a throttle device of the refrigerating cycle is almost fully opened or almost fully closed.

Claim 116 (new): The device for controlling a refrigerating cycle according to claim 109, wherein the control section sends output signals to a heat exchanger motor driving section so that a heat exchanger motor of the refrigerating cycle is kept halted.

Claim 117 (new): The device for controlling a refrigerating cycle according to claim 109, wherein once the control section starts an operation of the compressor, the control section sends output signals to the compressor driving section after a first predetermined period of time and drives the power source of the compressor so that a motive power exceeding a second predetermined motive power is generated, thereby operating the refrigerating cycle.

Claim 118 (new): The device for controlling a refrigerating cycle according to claim 115, wherein once the control section starts an operation of the compressor, the control section sends output signals to the throttle device driving section so as to set the opening ratio of the throttle device a predetermined opening ratio after a first predetermined period of time.

Claim 119 (new): The device for controlling a refrigerating cycle according to claim 116, wherein once the control section starts an operation of the compressor, the control section sends output signals to the heat exchanger motor driving section after a second predetermined period of time so as to start an operation of the heat exchanger motor, sends output signals to the compressor driving section so as to generate a motive power lower than a first predetermined motive power, and drives the power source of the compressor so as to generate a motive power exceeding a second predetermined motive power, thereby operating the refrigerating cycle.

Claim 120 (new): The device for controlling a refrigerating cycle according to claim 117, wherein when the control section performs a predetermined processing and judges to select a

channel by the channel selector valve or to halt an operation of the refrigerating cycle,

the control section sends output signals to the compressor driving section: to drive the power source of the compressor with a third predetermined capacity so as to generate a motive power lower than a second predetermined motive power; or to halt the operation of the compressor, thereby halting the operation of the refrigerating cycle.

Claim 121 (new): The device for controlling a refrigerating cycle according to claim 109, wherein when the control section performs a predetermined processing and judges to select a channel by the channel selector valve or to halt an operation of the refrigerating cycle,

the control section sends output signals to the compressor driving section to halt the operation of the compressor, then keeps the refrigerating cycle standby for a third predetermined period of time, then sends output signals to the compressor driving section to start the operation of the compressor, then renews position data in a memory unit to a first or second position after a first predetermined period of time, thereby halting the operation of the compressor cycle.

Claim 122 (new): The device for controlling a refrigerating cycle according to claim 109, wherein when positional data memorized by a memory unit of the control section indicate a first or second position, the control section starts an operation of the refrigerating cycle so that a motive power exceeding a first predetermined motive power is generated as an internal motive power of the channel selector valve.

Claim 123 (new): A device for controlling a refrigerating cycle, which controls a channel selector valve communicated to the refrigerating cycle, comprising:

a control section that receives input signals sent from an operation command section for commanding an operation state of the refrigerating cycle and from a physical quantity detector section for detecting a physical quantity generated by the refrigerating cycle, wherein the control section sends output signals to a driving section that drives a drive source of at least one of a plurality of functional components communicated to the refrigerating cycle so as to control said functional component and to control the refrigerating cycle, and when judging not to select a channel by using the channel selector valve on the basis of a command of the operation command section, the control section sends output signals to a driving section for driving a power source of a compressor so as to start an operation of the compressor of the refrigerating cycle and starts an operation of the refrigerant cycle so as to generate a motive power lower than a first predetermined motive power, thereby the channel selector valve is passively controlled.